

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Improvements in and relating to Football Bladders, and Valve Sealing means therein

We, TUCK & COMPANY LIMITED, a British Company, previously of 76, Victoria Street, London, S.W.1, now of Peregrine Road, Hainault, Ilford, Essex, do hereby declare this invention for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to inflatable football bladders made of rubber or like elastic material, and is concerned with the sealing means thereof for maintaining the bladder in inflated condition.

The invention consists in valve sealing means for an inflatable bladder of rubber or the like, more especially for footballs comprising an open-ended, tubular valve seating moulded as an integral part of, and projecting into, the bladder adapted to receive a removable plug closed at its inner end but having a central passage terminating in a substantially radial conduit which at its outlet is closed by the valve seating when the plug is inserted therein, the valve seating being formed with an internal step or shoulder to prevent easy or inadvertent removal of the plug therefrom.

The invention will be clearly understood from the following description of one form (given, however merely by way of example) which it may assume, and this description will be more readily followed by reference to the accompanying drawing which represents in side section a valve seating and valve plug in a football bladder according to the invention.

In carrying the invention into effect in one convenient manner as shown in the accompanying drawing a football bladder is formed with a suitable aperture to receive sealing means. While the bladder may be formed in any convenient manner to receive sealing means accord-

ing to this invention, reference may be made by way of example, to seamless bladders formed by joining together edge to edge, a plurality of precut panels, as described in the specification of co-pending Patent Application No. 16216/51 (Serial No. 713,262). In bladders built in that manner there is provided, at a junction point of the two sections, or at a common junction point of all four sections, as the case may be, a small circular aperture which houses an internally projecting valve seating also preformed from uncured rubber compound assembled with the "blanked" sections, and cured and at the same time permanently joined to the sections in the aperture provided, during the aforesaid curing operation. The valve seating is hollow and in the form of an annulus 1, adapted to fit the aperture in the bladder, having a short inwardly projecting tube 2 terminating in a conical "head" having a projecting shoulder where it joins the tube, so that it represents a spear head in section. The tip of the conical "head" is open.

The valve seating is adapted to receive a removable non-return valve plug (which may also be formed of rubber or the like) when the finished bladder is being prepared for inflation (e.g. in the outer casing of a football). This valve plug may be of integral construction and comprise a conical head 3, closed at its tip, carried at one end of a short tube 4, of narrower diameter than the base or shoulder of the conical head, while at its other, outer end, which is open, this short tube 4 carries an annular disc 5. One or more narrow, substantially radial conduits 6 extend through the side wall of the conical valve head 3 to allow air flow out of the valve plug from the bore of the tube.

It will be seen that the external shape of the valve plug 3, 4 conforms with the internal shape of the valve seating 2, and

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when the valve plug is forced into the seating the shoulders of the latter embrace the step of the valve head to hold it firmly in position, while the conical portion of the valve seat presses tightly against the sides of the conical valve head to seal the conduit(s) 6 therethrough. When the seating holds in the valve plug the annular disc 5 of the latter is held 10 firmly against the outside of the bladder. It will be seen that when the nipple of a pump or other inflating means is inserted in the valve plug 4 and air is impelled the valve seating 2 yields to allow passage 15 of air into the bladder for inflation, but thereafter closes the valve conduits 6 to prevent air escape, thus forming an effective non-return valve. To deflate the bladder the valve plug may be forcibly withdrawn from the seating or may be 20 arranged and actuated in the manner and by means such as described in the specification of co-pending patent Application No. 6319/50 (Serial No. 690,994). The annular disc 5 of the valve plug may be 25 externally stepped centrally (as shown) to form a thicker circular central annulus adapted to fit a circular aperture in the outer football cover, and of the same 30 depth as the thickness of the outer cover, so that when the bladder is inflated in a cover the outer surfaces of the valve plug and cover lie flush. The upper surface 35 of this stepped portion of the valve plug may be curved or domed to conform with the curvature of the football cover when the bladder is of spherical or spheroidal shape for footballs used in the Association game, but may be ellipsoidal for Rugby 40 footballs.

What we claim is:—

1. Valve seating means for an inflatable bladder of rubber or the like, more especially for footballs comprising an open-ended tubular valve seating moulded as an integral part of, and projecting into, the bladder, adapted to receive a removable plug closed at its inner end but having a central passage terminating in a substantially radial conduit which, at its outlet is closed by the valve seating when the plug is inserted therein, the valve seating being formed with an internal step or shoulder to prevent easy or inadvertent removal of the plug therefrom.

2. Valve seating means as claimed in Claim 1 wherein the valve seating is internally of spear-head section adapted to receive a head of the plug of similar 60 external section.

3. Valve seating means as claimed in Claim 1 or 2 in which the plug has an annular flange at its outer end.

4. Valve seating means as claimed in Claim 3 wherein the flange is stepped and the central upraised step fits and fills an aperture in the outer casing of a football when the bladder is inflated therein.

5. Valve seating means for a bladder 70 substantially as described with reference to the accompanying drawing.

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#### PROVISIONAL SPECIFICATION

#### Improvements in and relating to Football Bladders, and Valve Sealing means therein

We, TRICK & COMPANY LIMITED, a British Company, previously of 76, Victoria Street, London, S.W.1, now of Peregrine Road, Hainault, Ilford, Essex, do hereby declare this invention to be 75 described in the following statement:—

This invention relates to football bladders made of rubber or like elastic 80 material.

According to the invention a football bladder is formed by the "seamless" assembly of a plurality of pre-cut panel 85 sections. By "seamless" assembly is meant the joining together of the sections edge to edge without overlapping by a process analogous to welding, and such joining together may be carried out by 90 heating in a mould, wherein at the same time the sections are cured. The bladder

preferably comprises an internally projecting valve seating, which is preferably integral with the bladder and secured therein by the same process and 95 at the same time as the moulding together of the panel sections. This seating is adapted to receive a removable non-return valve which lies flush with the outer case of the football and avoid the 100 need to provide lacing therein.

The invention will be clearly understood from the following description of forms (given, however, merely by way of 105 example) which it may assume.

In carrying the invention into effect in one convenient manner a football bladder is formed by joining together edge to 110 edge two or four panels previously cut or "blanked" to suitable shape from cal-

andored sheet rubber compounds, and subsequently curing the assembly. At a junction point of the two sections, or at a common junction point of all four sections, as the case may be, a smaller circular aperture houses an internally projecting valve seating also preformed from uncured rubber compound, assembled with the "blanked" sections, and cured, and at the same time permanently joined to the sections in the aperture provided, during the aforesaid curing operation. The valve seating is hollow and in the form of an annulus, adapted to fit the aperture in the bladder, having a short inwardly projecting tube terminating in a conical "head" having a projecting shoulder where it joins the tube, so that it represents a spear head in section. The tip of the conical "head" is open.

The valve seating is adapted to receive a removable non-return valve (which may also be formed of rubber) when the finished bladder is being prepared for inflation (e.g. in the outer casing of a football). This valve may be of integral construction and comprise a conical head 3, closed at its tip, carried at one end of a short tube 4 of narrower diameter than the base or shoulder of the conical head, while at its other, outer, end, which is open, this short tube carries an annular disc. One or more narrow conduits extend through the side wall of the conical valve head to allow air flow out of the valve from the bore of the tube.

It will be seen that the external shape of the valve conforms with the internal shape of the valve seating and when the valve is forced into the seating the shoulders of the latter embrace the step of the valve head to hold it firmly in position, while the conical portion of the valve seat presses tightly against the sides of conical valve head to seal the conduit(s) therethrough. When the seating holds in the valve the annular disc of the latter is held firmly against the outside of the bladder. It will be seen that when

the nipple of a pump or other inflating means is inserted in the valve and air is impelled the valve seating yields to allow passage of air into the bladder for inflation, but thereafter closes the valve conduits to prevent air escape, thus forming an effective non-return valve. To deflate the bladder the valve may be forcibly withdrawn from the seating or may be arranged and actuated in the manner and by means such as described in the specification of co-pending patent Application No. 6819/50 (Serial No. 690,334). The annular disc of the valve may be externally stepped centrally to form a thicker circular central annulus adapted to fit a circular aperture in the outer football cover, and of the same depth as the thickness of the outer cover, so that when the bladder is inflated in a cover the outer surfaces of the valve and cover lie flush. The upper surface of this stepped portion of the valve may be curved or domed to conform with the curvature of the football cover when the bladder is of spherical or spheroidal shape for footballs used in the Association game, but may be ellipsoidal for Rugby footballs.

The valve for insertion in the valve seating is moulded separately by any suitable means, and when it is completed the bladder can be inserted into an outer football cover, the valve inserted in the bladder seating and the football inflated ready for use.

It should be understood that the invention is not restricted solely to the details of the forms, apparatus and method of manufacture described above, which may be modified, in order to carry the invention into effect under different conditions and requirements encountered, without departing in any way from the scope of the invention.

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale.*

